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VOL. 9 NO. 8 FEBRUARY 20, 1959

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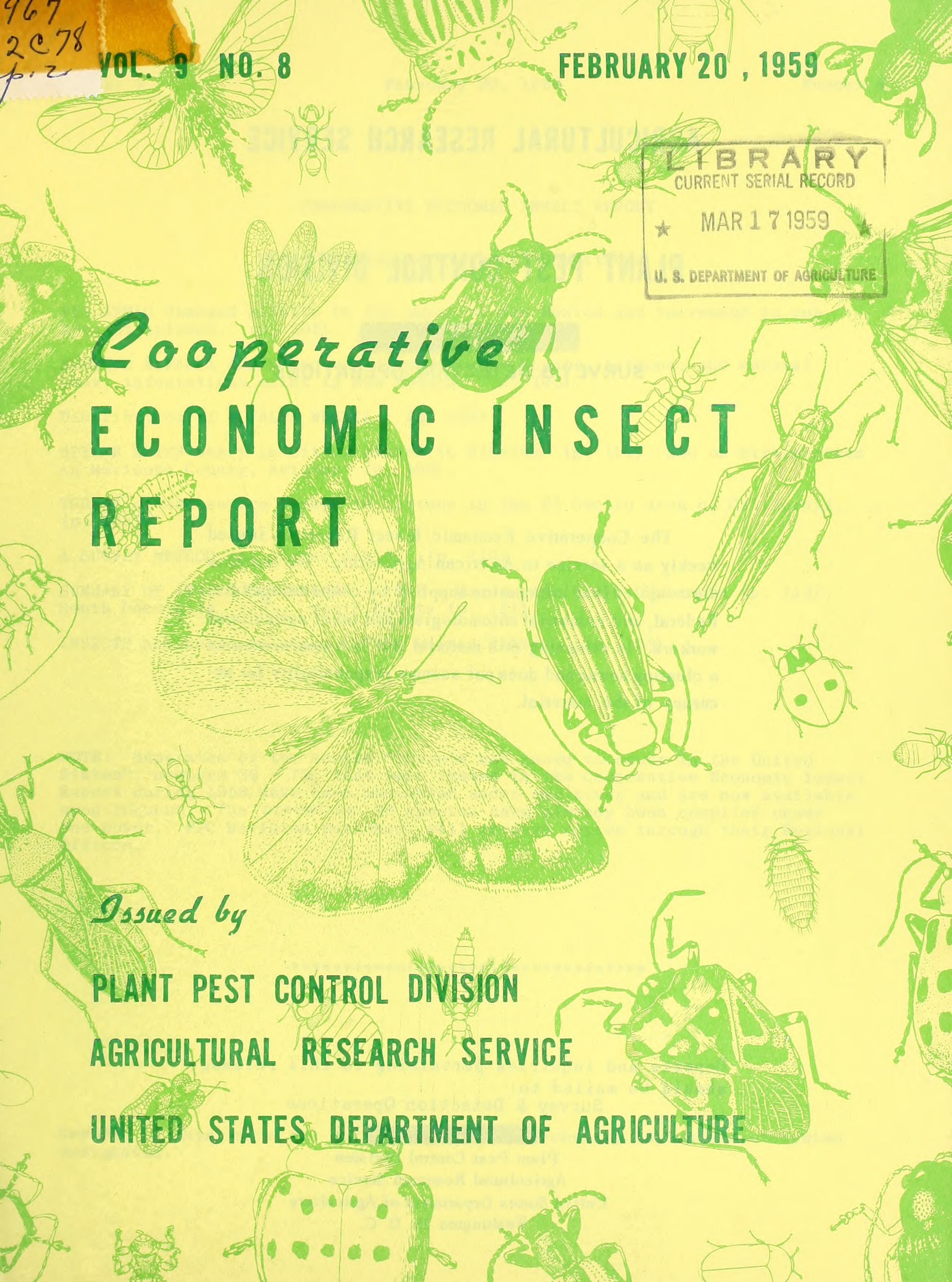

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

PLANT PEST SURVEY

SURVEY & DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Survey & Detection Operations
Plant Pest Survey
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
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Volume 9 February 20, 1959 Number 8

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

PEA APHID damaged alfalfa in two areas of New Mexico and increased in one area of Arizona. (p. 105).

SPOTTED ALFALFA APHID increased in Maricopa County, Arizona, and several heavy infestations exist in New Mexico. (p. 105).

Distribution of ALFALFA WEEVIL. (p. 106).

SPIDER MITES heavy in citrus groves in Florida (p. 107) and on strawberries in Maricopa County, Arizona (p. 108).

THRIPS caused severe damage to lettuce in the El Centro area of California. (p. 108).

A SURVEY METHOD for clover aphid. (p. 110).

SUMMARY OF INSECT CONDITIONS - 1958 - Kansas (p. 111), Nebraska (p. 114), South Dakota (p. 118), North Dakota (p. 121).

INSECTS not known to occur in the United States. (p. 125).

NOTE: Separates of the series "Insects not known to occur in the United States", numbers 36 - 72, that were issued in the Cooperative Economic Insect Report during 1958, have been assembled under one cover and are now available upon request. The preceding 36 species have already been compiled under one cover. PPC Division personnel will receive copies through their Regional Offices.

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Reports in this issue are for the week ending February 13, unless otherwise designated.

WEATHER BUREAU 30-DAY OUTLOOK

MID-FEBRUARY TO MID-MARCH 1959

The Weather Bureau's 30-day outlook for the period mid-February to mid-March calls for temperatures to average below seasonal normals over the northern third of the Nation east of the Continental Divide. Above normal temperatures are predicted over the southern third of the country and also for the entire area west of the Divide. In areas not specified, near normal averages with large temperature fluctuations are in prospect. Precipitation over the eastern two-thirds of the Nation is expected to be subnormal over the south and also over the northern tier of states. Amounts exceeding normal are expected in West Coast states. In unspecified areas near normal precipitation is indicated.

Weather forecast given here is based on the official 30-day "Resume and Outlook", published twice a month by the Weather Bureau. You can subscribe through Superintendent of Documents, Washington 25, D. C. Price $4.80 a year, $2.40 a half year.

WEATHER OF THE WEEK ENDING FEBRUARY 16

The week was cooler than normal by as much as 9° in the Far West, 15° in the northern Great Plains, and 3° in the extreme Northeast. Elsewhere, the week was unseasonably mild with weekly averages as much as 15° above normal in the Southeast. Subzero minima, occurring in the northern Great Plains on at least 4 nights, extended to southern Nebraska on the 10th and over Wisconsin on the 11th. Minima were near or below zero over much of New York and New England on the 12th, where extreme lows of -31° and -23° were recorded at Saranac, New York, and Newport, Vermont, respectively, and again on the 16th in northern areas. In the Southern States, afternoon temperatures ranged in the 60's and 70's on several days, and early in the week highs in the 60's were recorded as far north as Indianapolis, Indiana, Columbus, Ohio, and Pittsburgh, Pennsylvania.

Precipitation was both frequent and widespread, with heavy amounts in the East and the Pacific States. The moisture situation was much imporved in California by general precipitation from the 9th to 12th, and heavy precipitation was again falling in that State as the week ended. Unusually heavy rains fell in an area extending from the lower Mississippi Valley to the Great Lakes at the beginning of the week. Amounts of 2 to over 3 inches fell on frozen ground in Ohio and Indiana, causing severe floods in northwestern Ohio and in the Wabash Basin of Indiana. In the latter State, many factories and businesses and hundreds of homes were flooded. Severe glaze in southern Michigan, most of New York State and southern New England early in the period caused widespread damage.

Snowfall in northern areas east of the Rockies was mostly light, although a few locally heavy amounts were reported. Blizzard conditions occurred in North Dakota on the 15th. The snow cover east of the Rockies is now limited to rather extreme northern areas, where it is very heavy locally. The cover in central and east central Wisconsin, 15 to 20 inches, is unusually deep there. In the Far West, snowfall early in the week covered most of the eastern agricultural areas of Washington and the cover over the wheat region now ranges from a few inches in the south to 8 or 10 inches in the north. In the upper Mississippi Valley, the ground is frozen 3 to 6 feet deep in Wisconsin, and generally 4½ to 5½ feet deep in Minnesota. Wadena, Minnesota, reported that the ground was frozen 7 feet deep. Frozen underground pipes in sections of Minnesota indicate that this frost penetration is unusually deep. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GREENBUG (Toxoptera graminum) - NEW MEXICO - Populations apparently decreased due to cold weather. Averaged 1-10 per linear foot on winter wheat in Curry and Roosevelt Counties. Heavier, 30-60 per linear foot, in grain fields near Artesia, Eddy County. (N. M. Coop. Rpt.).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - NEW MEXICO - Light in grain fields in Curry, Roosevelt, Eddy, Chaves and Quay Counties. (N. M. Coop. Rpt.).

CORN LEAF APHID (Rhopalosiphum maidis) - NEW MEXICO - Occasionally light on barley in Eddy, Lea, Roosevelt, Curry, Chaves and Quay Counties. (N. M. Coop. Rpt)

COWPEA APHID (Aphis medicaginis) - ARIZONA - Populations increasing in small grain fields in Maricopa County. (Ariz. Coop. Sur.).

PEA APHID (Macrosiphum pisi) - ARIZONA - Becoming numerous on alfalfa in Maricopa County. (Ariz. Coop. Sur.). NEW MEXICO - Heavy and damaging to seedlings and established alfalfa stands in Dexter-Hagerman area, Chaves County, and near Ft. Sumner, De Baca County. Few growers applying controls. (N. M. Coop. Rpt.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - OKLAHOMA - Of populations examined in Stillwater area, 26 percent of aphids were on plants and 74 percent were in ground trash. (Ketner). Populations in alfalfa fields decreased in same area. (Bryan). ARIZONA - Becoming numerous on alfalfa in Maricopa County. (Ariz. Coop. Sur.). NEW MEXICO - Several heavy infestations found on nonresistant varieties in Eddy and Lea Counties. Light to moderate in southern and southeastern counties. Very few growers attempting control. (N. M. Coop. Rpt.). KANSAS - Counts per 25 plants on February 6 were 20 in Riley County and 5 in Pottawatomie County. On February 7, counts per 25 plants were 0 and 4 in two fields in Republic County and 0 in two fields and 2 in one field in Cloud County. (Simpson, Burkhardt).

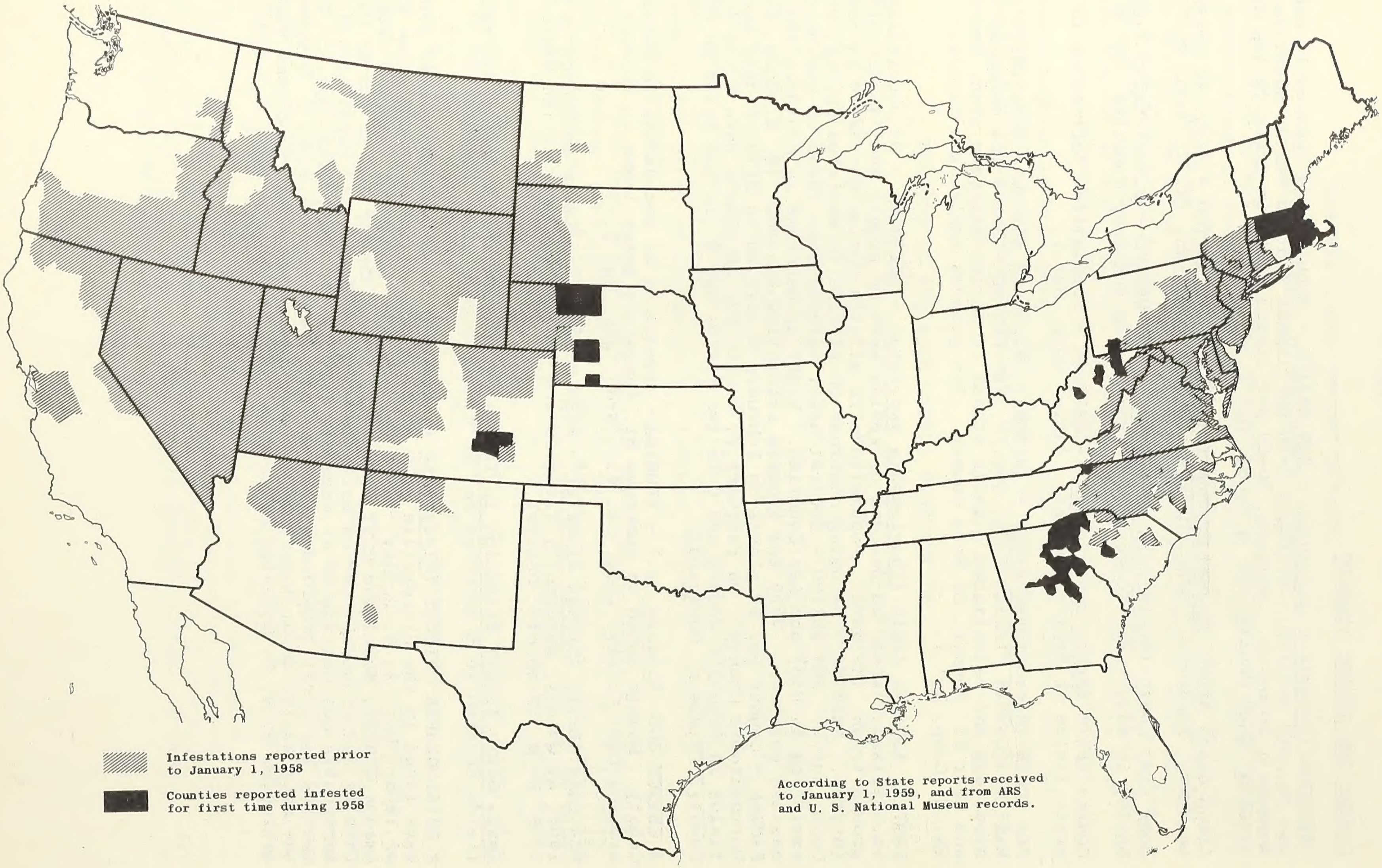
A CHINCH BUG (Blissus sp.) - FLORIDA - Appears to be decreasing in Brevard County. Damage noted on numerous St. Augustine grass lawns in Coconut Grove area of Dade County. (Fla. St. Plt. Brd., Jan. Rpt.).

PEA LEAF WEEVIL (Sitona lineata) - WASHINGTON - Specimens collected in August, 1958, at Quincy, apparently first record for eastern part of the State. Det. U. S. N. M. (Prescott, Donier).

Small Grain Insect Situation in Texas - No outstanding infestations found in fields checked in 5 counties in the Winter Garden area. (Hawkins).

A SHIELDBEARER CRICKET (Platycleis tessellata) - CALIFORNIA - Heavy populations were found in the Placerville area of El Dorado County on range grass in June of 1958. Det. A. B. Gurney. This species also occurs in Plymouth area of Amador County, Mokelumne Hill area of Calaveras County and in Placer County. This is an Old World species known to occur in Europe and North Africa. Apparently not considered of economic importance. (Cal. Coop. Rpt.). This species was first recorded in the United States in 1955 by H. F. Strohecker in the Pan-Pacific Entomologist 31 (4):203; though the first specimens were collected by R. O. Schuster on June 15, 1951, at Placerville, California. (PPC).

DISTRIBUTION OF ALFALFA WEEVIL *(HYPERA POSTICA)*


▨ Infestations reported prior to January 1, 1958
■ Counties reported infested for first time during 1958

According to State reports received to January 1, 1959, and from ARS and U. S. National Museum records.

FRUIT INSECTS

SCALE INSECTS - FLORIDA - *Aspidiotus perniciosus* quite noticeable on pear trees in the Jacksonville and Macclenny areas. (Fla. St. Plt. Brd., Jan. Rpt.). ARIZONA - Spotted infestations of *Icerya purchasi* on lemons and shrubs in the Yuma area. Minor infestations reported on grapefruit east of Mesa, Maricopa County. (Ariz. Coop. Sur.). CALIFORNIA - *Lepidosaphes beckii* medium on citrus in San Diego County. *Aonidiella aurantii* light to heavy on lemon trees in the Dinuba area of Tulare County. (Cal. Coop. Rpt.).

SPIDER MITES (*Tetranychus* spp.) - FLORIDA - Heavy infestations in citrus groves and about 50 percent of citrus nurseries inspected in Hillsborough and Pinellas Counties. (Fla. St. Plt. Brd., Jan Rpt.).

TRUCK CROP INSECTS

BEET ARMYWORM (*Laphygma exigua*) - ARIZONA - Controls necessary in most lettuce fields in Maricopa County during January. Further control not necessary at present time. Injured cantaloups under caps in some fields in same county. (Ariz. Coop. Sur.).

CABBAGE APHID (*Brevicoryne brassicae*) - GEORGIA - Light infestations on cabbage in Colquitt, Thomas, Grady, Brooks and Lowndes Counties.(Johnson). ARIZONA - Small numbers on cole crops in Maricopa County. (Ariz. Coop. Sur.).

GREEN PEACH APHID (*Myzus persicae*) - ARIZONA - Present in all fields of sugar beets grown for seed in Salt River Valley. Becoming numerous, with controls already started in some fields. (Ariz. Coop. Sur.).

AN APHID (*Macrosiphum barri*) - ARIZONA - Appeared on lettuce in Maricopa County, with control necessary in most areas. (Ariz. Coop. Sur.).

SPOTTED CUCUMBER BEETLE (*Diabrotica undecimpunctata howardi*) - TEXAS - Some damage still observed on spinach in Zavala and Dimmit Counties. Controls applied as preventive measure. (Harding, Hawkins).

DARKLING BEETLES (*Metoponium* spp.) - ARIZONA - Caused slight damage in watermelon fields in the Litchfield area, Maricopa County. (Ariz. Coop. Sur.).

WHITE-FRINGED BEETLES (*Graphognathus* spp.) - NEW JERSEY - Surveys were conducted in the Vineland area throughout the 1958 growing season. Observations were made for larvae during spring planting and adult surveys were conducted during July, August and September in and around properties formerly infested. The area was again checked in October and sweetpotatoes were checked for damage as they were dug. No live beetles were encountered. Beetle fragments were found on 2 formerly infested properties in July and August. Although this is not indicative of current infestation, treatment was applied at the spots involved. Despite negative findings, regulatory measures remain in effect in the involved area and will continue pending results of future surveys. The last live beetle was found during survey conducted in July, August and September, 1957. (PPC, East. Reg.).

SEED-CORN MAGGOT (*Hylemya cilicrura*) - TEXAS - Some damage still observed on spinach in Zavala and Dimmit Counties. Controls applied as preventive measure. (Harding, Hawkins).

THRIPS - TEXAS - Frankliniella sp. reported in CEIR 9(5):50 on spinach in Zavala County, determined as F. occidentalis. This is the first report of this species attacking spinach in the State. (Harding). CALIFORNIA - Frankliniella spp. caused severe damage to lettuce plantings in the El Centro area, Imperial County. (Peterson).

SPIDER MITES (Tetranychus spp.) - ARIZONA - T. telarius and T. pacificus severe in some fields of strawberries in the Glendale area of Maricopa County. Good control being obtained. (Ariz. Coop. Sur.).

TOBACCO INSECTS

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light on tobacco plant beds in Tift, Colquitt, Thomas, Grady, Brooks and Lowndes Counties. (Johnson).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

A NOCTUID (Melipotis acontioides) - FLORIDA - Larvae caused heavy defoliation of Delonix regia trees at Key West, Monroe County. (Martinez). This is the first report of defoliation for 1959. (Fla. Coop. Sur.).

A FIR ENGRAVER (Scolytus sp. near ventralis) - CALIFORNIA - Larvae heavy in maplewood bark in Modesto, Stanislaus County. (Cal. Coop. Rpt.).

BOXWOOD LEAF MINER (Monarthropalpus buxi) - VIRGINIA - Damaged leaves of about 40 American boxwood trees in Fredericksburg. (Rowell).

SCALE INSECTS - FLORIDA - Fiorinia theae moderate to heavy on camellias and hollies across the northern portion of the State. (Fla. St. Plt. Brd., Jan. Rpt.). ARIZONA - Aonidiella aurantii light on ornamentals in the Yuma area. (Ariz. Coop. Sur.). CALIFORNIA - Diaspis boisduvalii medium on orchids in the Carpinteria area of Santa Barbara County, as is Parlatoria camelliae on camellia in Auburn, Placer County. Fiorinia fioriniae heavy on Rhus integrifolia in La Jolla, San Diego County. Aspidiotus juglans-regiae heavy on California holly at Corona, Riverside County. (Cal. Coop. Rpt.).

AN ERIOPHYID MITE (Aceria mackiei) - CALIFORNIA - Heavy on live oak in the Oakdale area of Stanislaus County. (Cal. Coop. Rpt.).

INSECTS AFFECTING MAN AND ANIMALS

MOSQUITOES - FLORIDA - Populations increased in Brevard County. Remained very annoying on lower east coast of Volusia County. Continue at peak population in Indian River area. (Fla. St. Plt. Brd., Jan. Rpt.).

CATTLE GRUBS (Hypoderma spp.) - ARIZONA - Many cattle killed at Phoenix packing plants show heavy infestations. (Ariz. Coop. Sur.).

TROPICAL RAT MITE (Ornithonyssus bacoti) - OKLAHOMA - Caused dermatitis to some humans in some rural areas of Tillman County. (Howell).

HOG LOUSE (Haematopinus suis) - KANSAS - Of 100 hogs examined in Riley and Pottawatomie Counties, all were infested. (Knapp).

HORSE SUCKING LOUSE (Haematopinus asini) - VIRGINIA - Collected by veterinarian at Warrenton, Fauquier County. Det. C. F. W. Muesebeck. (Freund).

LIGHT TRAP COLLECTIONS

	Pseudaletia unipuncta	Agrotis ypsilon	Feltia subterranea
FLORIDA			
Gainesville 2/5-11	1		5
Quincy 1/20-26			1
SOUTH CAROLINA			
Charleston 2/2-15	28	28	54

Additional Collection: SOUTH CAROLINA - Charleston, 2/9-15, Prodenia ornithogalli 17.

CLOVER APHID

The following sampling method for clover aphid (Anuraphis bakeri) was developed for work in red clover fields in Washington.

Early in the season (up until about July 1 in the Columbia Basin of Washington), the aphids will be found under the stipules; later, they will be under the bracts of the heads; still later, they will be throughout the heads and on the stems and foliage in heavy infestations. Ten-stipule or 10-head samples (depending upon seasonal development) are taken at random from 5 areas of the field, the 4 sides and the middle. Sometimes only the margins of the field are sampled, since these areas become infested first.

With colonies of 25 aphids or less per stipule or head, actual counts are taken. When populations become high, the aphids are estimated in 5's or 10's. Such estimating can be done with good results if the stipules or heads are opened up and turned slowly while counting. Individual heavily-infested heads can be torn apart and the aphids counted as a check on the accuracy of estimations.

The figures for light, medium and heavy clover aphid in red clover grown for seed in the State of Washington are dependent upon the time of hay cutting.

Number of Clover Aphids per 10 Heads or Stipules

Degree of Infestation	Weeks after hay cutting				
	3	4	5	6	7
Light	0-5	0-10	0-15	0-50	0-150
Medium	10-25	15-50	20-100	60-250	200-750
Heavy	25+	75+	200+	500+	1000+

The aphids are moving from the stipules to the heads during the fourth and fifth weeks after hay cutting. Starting in 1959, a treatment will be recommended in this State during the fourth and fifth week after cutting if a medium infestation is present. It has been found that an early treatment is effective and that this level of infestation causes a reduction in yield which will more than pay for the treatment. (Carl Johansen)

SUMMARY OF INSECT CONDITIONS - 1958

KANSAS

Prepared by David L. Matthew and Leroy L. Peters*

Highlights: GRASSHOPPER populations were the highest in western counties since 1949. Over 87,000 acres of rangeland were treated in Morton County and over 122,000 additional acres were treated as part of a joint Federal-State-County-Rancher cooperative control program which included eighteen counties. Thirty-two other counties had organized control programs. CORN FLEA BEETLE caused much concern in early spring corn plantings. VARIEGATED CUTWORM infestations were the highest in several years in central and southern areas. SPOTTED ALFALFA APHID failed to establish any sizeable populations or increase to destructive numbers until late fall. WHITE GRUBS threatened 20,000 acres of rangeland in the Flint Hills area.

Cereal and Forage Crop Insects: A maximum hatch of GRASSHOPPERS, predominantly Melanoplus spp. and other mixed populations of range and crop species, threatened several thousand acres of crops in the western half of the State, particularly the western one-fourth. The severe infestation in 1958, heaviest since 1949, resulted in part from a heavy migration into western counties the fall of 1957. Dominant species was MIGRATORY GRASSHOPPER (Melanoplus bilituratus). Mixed population nymphal counts along roadsides, fence rows and weed fields ranged generally to highs of over 250 per square yard. One localized area had 1,200 nymphs per square yard. Over 122,000 acres of roadsides were treated in 18 western counties as part of a joint Federal-State-County-Rancher grasshopper control program. An additional 32 counties had control programs without Federal aid. In Morton County, over 87,000 acres of government rangeland were treated with excellent results. Counts of 35 per square yard were reduced to less than 3 per square yard. GREENBUG (Toxoptera graminum) was not found in any wheat, barley and oat fields surveyed during late winter and early spring. ENGLISH GRAIN APHID (Macrosiphum granarium) was noneconomic to light and nowhere significant. PALE WESTERN CUTWORM (Agrotis orthogonia) was practically nonexistent in western counties where infestations had been common in 1956 and 1957. ARMY CUTWORM (Chorizagrotis auxiliaris) feeding activity continued at a very low level, perhaps the lowest in the last five years. FALSE WIREWORMS (Eleodes spp.) continued to decrease in general infestation but occurred in a few localized areas in north central and western counties. Although HESSIAN FLY (Phytophaga destructor) populations continued at noneconomic levels, increases were evident in the counties bordering Missouri and Nebraska. BROWN WHEAT MITE (Petrobia latens) was practically nonexistent. Late-fall infestations of DATE MITE (Oligonychus pratensis) damaged wheat seedlings in Sheridan, Gove, Rawlins and Thomas Counties. By mid-May CHINCH BUG (Blissus leucopterus) infestations were common in wheat and barley fields in localized areas in central, east central and southeastern counties. A few fields of late-planted spring barley were seriously damaged. Stands of grain sorghum were thinned in a few localities in this general area of the State. By June, active nymphal infestations were found in several eastern areas. In two Bermuda grass plantings on the campus of Kansas State College during July, there were severe enough infestations to cause localized areas of the lawns to die. PEA APHID (Macrosiphum pisi) was slow to develop on early alfalfa crops. Little damage occurred although aphids were found in most fields surveyed. Populations were noneconomic to moderate and seldom ranged over 1500 per 25 sweeps.

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*The following entomologists, and others, made contributions during the reporting season: R. E. Beer, J. E. Brady, C. C. Burkhardt, L. A. Calkins, L. J. DePew, E. L. Eshbaugh, H. D. Garwood, D. E. Gates, T. L. Harvey, F. A. Knapp, H. Knutson, F. A. Lawson, E. T. Jones, P. H. Marvin, R. H. Painter, S. Ratcliff, R. E. Simpson, W. H. Somsen, H. E. Thompson, G. D. White and D. A. Wilbur.

SWEETCLOVER WEEVIL (Sitona cylindricollis) caused more damage to second-year clover in 1958 than for the past five years. Damaged plants were particularly observed in north central and northeastern areas. CLOVER LEAF WEEVIL (Hypera punctata) was found in most alfalfa fields and in red clover; however, no great damage was observed as the larvae became diseased and feeding shortened. Counts ranged 1-9 per square foot in heavier infested fields. SPOTTED ALFALFA APHID (Therioaphis maculata) was very slow to develop throughout 1958 and failed to develop high populations until late summer and fall. Aphids were not found in northern counties until mid-August. However, in late fall, populations reached the highest level ever recorded in the State that late in the season. WEBWORMS (Loxostege spp.) were of much less importance in 1958 than in 1957. Populations were erratic in development and some occurred as late as mid-August in north central counties. Tip-infestation ranged 10-40 percent; however, timed cuttings prevented significant losses. CORN FLEA BEETLE (Chaetocnema pulicaria) was heavy in many localized areas, and during May was found in nearly all corn fields in the eastern half of the State. Populations were the highest in several years and counts ranged to 19 per plant, but averaged from 2-7 per plant in general. EUROPEAN CORN BORER (Pyrausta nubilalis) continued much the same as in 1957 and many fields in eastern and northeastern counties averaged 70 percent plant infestation. FALL ARMYWORM (Laphygma frugiperda) failed to develop to the highs of 1957; however, late infestations did develop in some fields of late corn. Even though late corn had whorl infestations that ranged to highs of 40 percent, eardrop from subsequent shank feeding nowhere approached 1957 levels and averaged only an estimated 2 percent. VARIEGATED CUTWORM (Peridroma margaritosa) was the heaviest in several years and caused extreme damage to many alfalfa fields and home gardens. Counts ranged to highs of 20 per square foot under baled alfalfa hay. Roadside sweetclover was stripped as were plants in some planted fields. ARMYWORM (Pseudaletia unipuncta) failed to cause the expected damage that was indicated by early summer counts. Moth flights were heavy but larvae failed to develop to destructive numbers and were only a problem in localized southeastern and north central areas, in fields of heavy and lodged barley. CORN EARWORM (Heliothis zea) was much lower than in previous years. Fall surveys showed fewer ears infested and much less over-all loss from secondary causes. SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) was higher than previous years with some fields in southern counties showing infestations as high as 80 percent. Infestations, however, were localized and not all fields affected. WHITE GRUBS (Phyllophaga spp.) caused vast damage to bluestem range in the Flint Hill areas of Wabaunsee, Geary, Pottawatomie, Riley and Osage Counties. Populations ranged 7-15 grubs per square foot and dead spots in the range varied from 5-12 acres in size. Over 20,000 acres of rangeland were affected.

Fruit Insects (E. L. Eshbaugh): APHIDS were not generally serious in orchards in 1958. Some damage by ROSY APPLE APHID (Anuraphis roseus) occurred in May and APPLE APHID (Aphis pomi) was numerous enough to curl leaves of terminal growth in some northeast orchards. CODLING MOTH (Carpocapsa pomonella) adults first emerged in the northeast area on May 19 and first entries were found June 2. Unsprayed Jonathan apple test trees in a well sprayed orchard were 75 percent "wormy" when harvested in September. Codling moth damage was greater in 1958 than for several years. RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) caused severe damage to Wealthy apples in Doniphan County and to late fall varieties in all areas of the State except a few orchards in the Arkansas River Valley. PLUM CURCULIO (Conotrachelus nenuphar) was normal for the State. Light infestations of UNSPOTTED TENTIFORM LEAF MINER (Callisto geminatella) occurred in May and June in Doniphan County. Although populations of EUROPEAN RED MITE (Panonychus ulmi) were light, this was the most noticeable mite on apples in Doniphan County in July and August. No destructive populations of TWO-SPOTTED SPIDER MITE (Tetranychus telarius) were found in Doniphan County or the Arkansas River Valley but were severe in the Kansas River Valley at Manhattan and Topeka. STRAWBERRY WEEVIL (Anthonomus signatus) was common during the early bloom in Doniphan County. STRAWBERRY LEAF ROLLER (Ancylis comptana fragariae) was not serious and caused damage only where control measures were not applied. PEACH TREE BORER (Sanninoidea exitiosa) damage was severe in the Arkansas River Valley, especially south of Wichita. As many as 34 borers were removed from some trees. TARNISHED PLANT BUG (Lygus lineolaris) and STINK BUGS were plentiful during the early season on peaches.

Ornamental and Shade Tree Insects (H. E. Thompson): During the past two years CANKERWORMS, primarily SPRING CANKERWORM (Paleacrita vernata), have been on the increase on several species of shade trees, primarily elm and hackberry, throughout the eastern area and a few local areas in the western part of the State. Feeding injury in some communities during 1958 was moderate to severe. Hackberry trees were also attacked by three generations of larvae of a BRUSH-FOOTED BUTTERFLY (Asterocampa celtis) in May, July and September. On elms in Hays and Salina, there was an infestation by larvae of a GEOMETRID, tentatively identified as Lycia ursaria. The main economic effect resulted from the droppings and descending caterpillars on the sidewalks and roadways. PSYLLIDS (Pachypsylla celtidis-mamma and P. celtidis-vesicula) were severe enough to cause some defoliation of hackberry in July and August. On other trees the leaves were distorted and brown. HACKBERRY NIPPLE GALL (P. celtidis-mamma) caused curling and dying of leaf foliage of economic proportions in some eastern areas. There were several SCALE INSECTS of economic importance. In the soft scale group, injury from EUROPEAN ELM SCALE (Gossyparia spuria) was severe in several western communities. In the eastern half of the State, EUROPEAN FRUIT LECANIUM (Lecanium corni) killed branches on several varieties of trees, primarily elm. Infestations of OAK KERMES SCALE (Kermes pubescens) caused distortion and death in the terminal growth of bur and pin oaks throughout most of the State. Of the armored scales, there were several that were local problems and by far the most widespread and injurious was a CEDAR SCALE (Cryptaspidiotus shastae). There is an infestation on the cedars in practically every cemetery in the State. The most severe infestations are killing the trees. In eastern and central Kansas, leaves on pin oaks were twisted and curled by infestations of a GALL MIDGE (Parallelodiplosis florida). In cases of severe infestation, some premature defoliation took place. ELM LEAF BEETLE (Galerucella xanthomelaena) was identified for the first time in Ford County from 2 adults taken in Dodge City. The number one pest on juniper, arborvitae and Norway spruce continues to be BAGWORM (Thyridopteryx ephemeraeformis). ELM LEAF APHID (Myzocallis ulmifolii) caused considerable annoyance and some tree damage in eastern areas of the State.

Insects Affecting Man and Animals (Stuart Ratcliff): NORTHERN CATTLE GRUB (Hypoderma bovis) was collected from local cattle in Saline, Riley and Morris Counties. This confirmed earlier reports of this species in the State. H. lineata was reported from throughout the State. SCREW-WORM (Callitroga hominivorax) was collected in Clark and Marion Counties in August and September and SECONDARY SCREW-WORM (Callitroga macellaria) was collected in Kingman County in April.

Stored-grain Insects (G. D. White): INDIAN-MEAL MOTH (Plodia interpunctella) appeared in large numbers and was a control problem over the entire State. LESSER GRAIN BORER (Rhyzopertha dominica) numbers increased in the northeast portion of the State, especially in CCC bin sites. ANGOUMOIS GRAIN MOTH (Sitotroga cerealella) increased in numbers from southeast areas to the Kansas River Valley. DERMESTIDS did not increase in numbers; however, they remained a problem. PSOCIDS increased in numbers.

Light Traps: Four dark-light insect traps continued in operation throughout the 1958 growing season. Traps were located in Finney, Ellis, Riley and Doniphan Counties. Abundance counts and migration patterns included armyworm, corn earworm, fall armyworm, European corn borer, variegated cutworm and army cutworm.

NEBRASKA

Reported by Lloyd W. Andersen, Roscoe E. Hill, Robert E. Roselle

Highlights: Entomological highlights for 1958 included heavy first and second broods of EUROPEAN CORN BORER over much of the corn-growing areas; GRASSHOPPERS again present in injurious numbers throughout the western two-thirds of the State; high larval populations of ARMYWORM in wheat in the eastern half of the State; the virtual disappearance of PALE WESTERN CUTWORM after five years of damage; continuation of the eastward spread of ALFALFA WEEVIL; an increase in CORN ROOTWORM populations; another late buildup of SPOTTED ALFALFA APHID in the southwest; large flights of BEET WEBWORM at light traps but with less than expected damage from the larvae in the field; and another generally heavy outbreak of MOSQUITOES.

Cereal and Forage Crop Insects: Legumes - ALFALFA WEEVIL (*Hypera postica*) surveys revealed a light local infestation in alfalfa in panhandle and southwestern counties. Scotts Bluff, Sioux, Morrill and Cheyenne Counties had larval populations up to 120 per 100 sweeps. New records included Cherry, Lincoln and Red Willow Counties. SPOTTED ALFALFA APHID (*Therioaphis maculata*) was present in economic numbers in the western Republican River Valley and Frenchman Creek areas. It was first found during the second week in July, in Red Willow County, and did not buildup to economic numbers until mid-August. It was not found until September 13 in the central Platte Valley. By late September and early October the population had increased greatly, and surveys showed well over 11,000 per 100 sweeps in the western Republican Valley region. Yellowing of alfalfa plants was noticeable. Surveys in December revealed aphids under snow cover up to 300 per alfalfa crown in Red Willow County. GREEN CLOVERWORM (*Plathypena scabra*) populations were very light during 1958 in alfalfa and soybeans in the eastern half of the State. Counts in early June through July ranged 9-19 per 100 sweeps in alfalfa and averaged 0.3 per 10-plant sample in soybeans. Moths were picked up at light traps at Lincoln, North Platte, Scottsbluff and Alliance throughout the summer months. Light populations of ALFALFA CATERPILLAR (*Colias philodice eurytheme*) occurred generally throughout the alfalfa-producing regions. Infestation began in early May and continued through mid-September. Larvae averaged 5 per 100 sweeps in early May, reached peak of 1 per sweep by early June, then dropped off, averaging 32 per 100 sweeps for the remainder of the season. ALFALFA WEBWORM (*Loxostege commixtalis*) produced moderate webbing in the southeast, south central and southwestern areas in alfalfa, beginning in early August. Larval counts ranged 10-120 per 100 sweeps during the season. PEA APHID (*Macrosiphum pisi*) infestations first occurred in southeastern alfalfa and red clover in early April. Buildup was slow through April and May and by early June had reached 4,847 per 100 sweeps, despite a fungus (*Entomophora* sp.) in late May. A moderate population continued through June (1000 plus per 100 sweeps) in most areas and dropped during July, possibly because of predators. A buildup occurred again in mid-August and continued into November. Seasonal counts per 100 sweeps averaged 1000 in the east, 240 in the southwest and 320 in the Platte Valley. TARNISHED PLANT BUG (*Lygus lineolaris*) populations were moderately general to spotted heavy. In early April counts ranged 5-7 per 100 sweeps. A general buildup occurred through May in southern regions. Early-June populations averaged 362 per 100 sweeps and continued high through the year. ALFALFA PLANT BUG (*Adelphocoris lineolatus*) was generally light in alfalfa throughout most of the State. Infestations ranged 43-174 adults and nymphs per 100 sweeps through June and remained somewhat static through the remainder of the year. RAPID PLANT BUG (*Adelphocoris rapidus*) was relatively light and spotted in alfalfa in eastern areas. Counts averaged 20 per 100 sweeps and very little damage resulted.

First overwintered adults of SWEETCLOVER WEEVIL (Sitona cylindricollis) were observed in sweetclover and litter in the southeast in early April. Counts ranged 5-7 per 10-crown sample and later 6-8. Damage to newly emerged seedlings was serious. LESSER CLOVER LEAF WEEVIL (Hypera nigrirostris) was light and spotted on red clover in the southeastern portion of the State. Counts ranged 4-6 per 25 sweeps throughout the year. Very little damage occurred to blossoms or stems of plants. CLOVER LEAF WEEVIL (Hypera punctata) was light in alfalfa in eastern areas. Larval counts averaged 15 and adults 11 per 100 sweeps. There was very little damage. POTATO LEAFHOPPER (Empoasca fabae) infestations were generally light in alfalfa. The first known occurrance was May 13 in the southeast. Several other species of leafhoppers were found May 5 and 6. No serious yellowing or "hopperburn" resulted in alfalfa. Moderate populations of BLISTER BEETLES (Epicauta spp.) were found in alfalfa fields in the southwest, south central, southeast and northeast areas from mid-June through September. Counts in mid-summer ranged 14-32 per 100 sweeps and reached as high as 100 per 100 sweeps in August.

The GRASSHOPPER trend continued its movement to the west and populations were more widely scattered. The north central and eastern one-fourth of the State are comparatively free of damaging infestations. A general increase occurred in the south central and panhandle counties. The initial hatch in cropland began in early May in the east and that of rangeland species in early June. Generally the major hatch was later and more prolonged due primarily to greater precipitation in these areas. The dominant cropland species over the State was Melanoplus bivitattus, followed closely by M. differentialis. The areas to the south and west are subject to migrations of M. bilituratus, which has become more widespread and abundant than at any time in the past 10 years. One of the larger flights of this species extended from west of Kearney, Buffalo County, to the western end of the State. Melanoplus femur-rubrum never reached destructive proportions and the population is the lowest in many years. The rangeland has shown little change in populations. The chief areas of high populations remain in the southern sandhills, the breaks along the Platte River and the light sandy soils of southern Lincoln County. The dominant species on the range are Ageneotettix deorum, Aulocara elliotti, Phlibostroma quadrimaculatum, Melanoplus bilituratus, M. foedus, M. occidentalis, Trachyrhachis kiowa, Amphitornus coloradus, Eritettix tricarnutus and Boopedon nubilum. Egg survey conducted in fall of 1958 indicated populations equivalent to those of the adult survey. However, large areas in the east and central portions of the State had an extremely high degree of parasitism within the egg pod. There are some areas where egg dessication is also taking place, but for the most part eggs have gone into the winter in good condition. Heavy fungus disease occurred in the southeast and central portions of the State which took a heavy toll in these regions. Federal control programs were carried on in Deuel and Cheyenne Counties in the summer where 41,369 acres of range were sprayed. A total of approximately 2,201,625 acres of both range and cropland were sprayed in the State in 1958.

Corn and Sorghum - BLACK CUTWORM (Agrotis ypsilon) caused moderate to spotted severe damage in the eastern third of the State in heavier soils. In some areas as high as 21 of 25 plants were damaged. Moths were collected in light traps at Lincoln, North Platte, Scottsbluff, Alliance and Kearney throughout the growing season. CORN LEAF APHID (Rhopalosiphum maidis) infestations were generally moderate to severe in corn and grain sorghum in eastern and southern areas of the State during July and August. High predator populations developed rapidly in most areas to check the infestation. WIREWORM (Melanotus spp.) populations were moderate to spotted heavy in the more heavy soils in eastern areas. Damage necessitating replanting of corn occurred in several northeast areas. FALL ARMYWORM (Laphygma frugiperda) infestation was very light in Platte Valley corn. Moth flights began in late August at Lincoln and North Platte and reached their peak in mid-October. Practically no damage resulted.

ARMYWORM (Pseudaletia unipuncta) infestations were light to moderate in corn in eastern and central areas. Some defoliation of corn resulted. CHINCH BUG (Blissus leucopterus) migrations from overwintering habitats to wheat and barley began in early April. Migrations from small grains began in early July. Only light damage occurred and it was estimated that approximately 1,000 acres were treated this spring. The survey conducted in the fall in 35 southeastern counties revealed noneconomic to very severe conditions existing. Counts ranged upwards to 2,000 or more per square foot in some areas. CORN ROOTWORMS (Diabrotica undecimpunctata howardi, D. virgifera and D. longicornis) damage continued to mount especially in those areas which have developed irrigation. CORN EARWORM (Heliothis zea) infestations in field and sweet corn were generally light to moderate throughout southeast, south central and central regions. Moth flights occurred in May at Lincoln, North Platte and Scottsbluff. All stages were present until frost. Damage to corn ears was light to moderate in nearly all the southeastern and south central counties where 80-95 percent infestations occurred in early September. Heavy moth flights occurred in mid-October at Lincoln and North Platte with a high weekly catch of 1,620 at North Platte. TWO-SPOTTED SPIDER MITE (Tetranychus telarius) populations were moderate in corn in panhandle counties during mid-summer. Damage to lower leaves was very noticeable. EUROPEAN CORN BORER (Pyrausta nubilalis) spring survival survey revealed a heavy winter mortality. In both northeast and Platte Valley areas mortality was approximately 96 percent with a 4 percent effective population. Populations per acre ranged from 1,328 in the southwest to 3,866 in the northeast. Pupation of overwintering borers began about May 20 in the southeast, east and central portions of the State, and by the first week in June had reached approximately 100 percent in all areas. Moths were collected at Lincoln June 3 and at North Platte June 6. Egg masses (50 per 100 plants) were found in the southeastern area June 10. Second-brood moths appeared during the third week in July and gradually reached a peak in mid-August. With the cool weather at that time, moths continued to fly until late September in some areas. The fall survey in 74 counties revealed 22-337 borers per 100 plants and infestation of 21.8 to 99 percent. Corn loss in 1958 was 23,102,178 bushels, valued at $23,102,178.

Other Cereal and Forage Crop Insects - Light infestations of WHEAT HEAD ARMYWORM (Faronta diffusa) occurred in winter wheat in southwest counties. Considerable injury to rye occurred in Lincoln County where counts ran 1.5 per sweep. ENGLISH GRAIN APHID (Macrosiphum granarium) was light to spotted moderate (averaged 12 per head in a 20-head sample) in small grains the early part of May through middle of June. The infested area embraced the eastern third, through the Platte Valley to the western part of the State. SIX-SPOTTED LEAFHOPPER (Macrosteles fascifrons) was very light in small grains during 1958 in comparison with 1957. WHEAT CURL MITE (Aceria tulipae) occurred throughout the panhandle and southwestern counties. Wheat streak mosaic was more widespread than it has been since the fall of 1953 and the spring of 1954. Examinations of wheat stubble taken in August from major wheat-producing counties indicated that infestation by HESSIAN FLY (Phytophaga destructor) was heavier than it has been since 1953. Parasitism of the flax-seed stage by either Merisus destructor or Eupelmus allynii was very prevalent, up to 90 percent in some areas. Supplemental surveys in the fall revealed a partial second brood which developed in early plantings of winter wheat and in volunteer wheat. ARMYWORM (Pseudaletia unipuncta) larval population was moderate to severe in rank and lodged wheat in the eastern third and central Platte Valley regions. Moth flights were extremely heavy at all light trap stations from late April into October. Five major moth flights were observed at light trap stations. A high single week catch at North Platte was 11,950 in early July. Larval infestations in small grains in the eastern half of the State were in accord with the number of moths collected at the light traps. Larval counts ranged 8-46 per square foot in many fields. PALE WESTERN CUTWORM (Agrotis orthogonia) infestations were very light in winter wheat and barley. This is the first time in 6 years that there were no economic losses in the panhandle area. Moth flights at Alliance started in late August and continued through September in small numbers. The highest single-day catch was 19 in early September compared with 103 in 1957.

Vegetable and Truck Crop Insects: POTATO LEAFHOPPER (*Empoasca fabae*) was not serious on potatoes in eastern, central or western areas. First occurrance was May 13 on alfalfa in the southeast and the first appearance on potatoes was approximately June 12. POTATO PSYLLID (*Paratrioza cockerelli*) was light on lycium, potatoes and tomatoes in central and western areas. No serious yellowing occurred on western area potatoes as compared with 1957. Populations based on an average found at seven locations and at 100 sweeps per location ranged .57 on May 5 to 23.5 on June 30. MEXICAN BEAN BEETLE (*Epilachna varivestis*) occurred in light to spotted moderate infestations during August in field beans in the Scottsbluff vicinity. TUBER FLEA BEETLE (*Epitrix tuberis*) was normal on potatoes in central and western portions of the State. BEET WEBWORM (*Loxostege sticticalis*) moth flights were extremely heavy from North Platte on west in early June. High weekly light trap catches were 8,569 at Scottsbluff, 15,530 at North Platte and 28,948 at Alliance. Larval populations in beets were not in accord with the moth catches; counts averaged 12 per 100 sweeps. Local heavy populations of WESTERN BEAN CUTWORM (*Loxagrotis albicosta*) occurred in field beans on the lighter soils in the Scottsbluff vicinity. Light infestations were again found in field corn in Scotts Bluff, Box Butte, Morrill, Garden and Keith Counties. Moths appeared as far east as North Platte.

Insects of Shade and Fruit Trees, Perennials and Ornamentals: BAGWORM (*Thyridopteryx ephemeraeformis*) populations were moderate to spotted heavy on evergreen, sycamore, pin oak and spirea in southeastern areas from early June and through July. WALNUT CATERPILLAR (*Datana integerrima*) was light to spotted moderate on walnut trees in northeast areas during mid-summer with some defoliation. SPRING CANKERWORM (*Paleacrita vernata*) caused moderate to severe damage. Nearly all river valley areas were infested. Approximately 70-85 percent of the woodland areas and windbreaks in some regions were defoliated. FALL WEBWORM (*Hyphantria cunea*) populations were moderate on elm, poplar and roadside shrubs in the eastern third of the State. GREEN-STRIPED MAPLEWORM (*Anisota rubicunda*) infestations were light to moderate along the Missouri River Valley from Richardson County to Thurston County. OYSTERSHELL SCALE (*Lepidosaphes ulmi*) was very prevalent on lilac in south central, central and eastern areas. Heavy damaging infestations of EUROPEAN ELM SCALE (*Gossyparia spuria*) continued in the eastern third, central and western portions of the State. NANTUCKET PINE MOTH (*Rhyacionia frustrana*) continued to be abundant on young ponderosa pine in established forest areas and in isolated plantings as far east as the Missouri River Valley. PINE NEEDLE SCALE (*Phenacaspis pinifoliae*) was moderate to heavy on pine in the Pine Ridge area, Halsey Forest and in pine windbreaks in central and eastern parts of the State. SPIDER MITES (*Tetranychus* spp.) were moderate to heavy on conifers, roses and garden vegetables in the eastern third and central portions of the State. Controls were used extensively throughout these areas. Heavy damaging populations of a LEAF ROLLER continued along the Platte Valley and in the northeast on locust trees with severe defoliation in many areas. PEACH TREE BORER (*Sanninoidea exitiosa*) was very abundant in fruit tree plantings in early spring. Loss of trees resulted in some regions.

Insects Affecting Man and Animals: MOSQUITOES - This summer and fall, as was the case the past two years, again saw one of the most serious mosquito outbreaks. The predominant species was *Culex tarsalis*. All species of *Culex* became more important after mid-July and persisted to the end of the season. *Aedes vexans* was predominant in the early part of the summer, but dropped in numbers in mid-summer, increased again in late August and early September.

The peak populations of *A. vexans* and *C. tarsalis* occurred in September. CATTLE GRUBS (*Hypoderma* spp.) - Adult activity was noticeable in late April and continued into June in the sandhill region. The population then developed into a near normal situation for the State. Approximately 140,000 head of cattle were treated in 1958. HORN FLY (*Siphona irritans*) continued to be very numerous on livestock in west and north central regions. STABLE FLY (*Stomoxys calcitrans*) populations were much higher than in 1957. Severe problems developed around feed lots and farm yards in the eastern portion of the State. HOUSE FLY (*Musca domestica*) continued to be a constant nuisance in urban and rural areas until frost with populations much higher than in 1957. CATTLE LICE (*Bovicola bovis* and *Hematopinus* spp.) were normal on livestock in feed lots in eastern and central regions. Untreated cattle were heavily infested with one or more species in many cases.

Stored-grain Insects: In stored wheat, live and dead insects were found in 73.0 percent of 256 bins examined, a number of which had recently been fumigated. Live insects occurred in 17.2 percent of the bins. Rodent contamination was present in 11.7 percent and bird contamination in 0.7 percent of those examined. Dermestids, saw-toothed grain beetle, granary weevil, cadelle and flat grain beetle were the most abundant. In stored corn, live and dead insects were found in 25.6 percent of 51 bins examined with dermestids, saw-toothed grain beetle, flat grain beetle and cadelle the most abundant. Rodent contamination was found in 51.9 percent of the bins.

Cooperators: The following Nebraska entomologists also contributed to the Cooperative Economic Insect Survey during 1958: C. Jones, R. Staples, C. Walstrom, D. Fitchett, J. Bell, K. Pruess, A. Hagen, G. Weekman, W. Howe, M. McKnight, G. Manglitz, B. Kantack and W. Rapp.

SUMMARY OF INSECT CONDITIONS - 1958

SOUTH DAKOTA

Compiled by W. M. Hantsbarger and Gale Mast

Highlights: GRASSHOPPERS increased in 1958, with large areas averaging 8 to 14 adults per square yard during the fall abundance survey. A migratory flight of MIGRATORY GRASSHOPPER occurred in the southwest. CORN ROOTWORMS caused considerable damage in southeastern and south central areas. CRICKETS were more abundant than usual in the eastern part of the State. Heavy infestations of PEA APHID and ENGLISH GRAIN APHID appeared in late spring and early summer. EUROPEAN CORN BORER populations are reduced from those of 1957.

Cereal and Forage Insects: TWO-STRIPED GRASSHOPPER (*Melanoplus bivittatus*) began hatching in the southeast area around the middle of May. A light hatch of *Camnula pellucida* was observed in the Keystone area a week later. Heavy hatches of DIFFERENTIAL GRASSHOPPER (*Melanoplus differentalis*) and *M. bivittatus* were noted in many areas of the State by the first of June. By the second week in June RED-LEGGED GRASSHOPPER (*M. femur-rubrum*) began to hatch. Nymphal populations in the extreme southeastern area reached as high as 150 per square yard in margins and 30 per square yard in alfalfa fields. Economic infestations were reported the latter part of June in Lyman, Union, Yankton and Clay Counties; the dominant species were *M. differentalis* and *M. bivittatus*. Flights of MIGRATORY GRASSHOPPER (*M. bilituratus*) appeared in Bennett County and in an area extending over to the central and northern Black Hills. Many acres of winter wheat were treated to protect the crop. The adult survey conducted throughout the State in August showed many acres rated 8 to 14 or more per square yard.

Areas of heavy infestation exist in Union, Clay, Yankton, Spink, Brown, Lyman, Hughes, Sully, Potter, Walworth, Fall River, Perkins, Pennington and Harding Counties. Much of the State which was noneconomic last season now has light to moderate populations. This increase is largely a result of a buildup of M. differentalis and M. bivittatus. A grasshopper egg survey held in October in general approximated findings of the adult survey. In some areas, parasitism by BOMBYLIID larvae was noticeable on the egg pods. Loss to crops from grasshopper activities is estimated at approximately $2,957,700. It has been estimated by county agents that 223,070 acres were treated for grasshopper control, resulting in a saving of $1,260,600.

FALSE WIREWORM (Eleodes spp.) infestations averaged from one to two larvae per linear foot of row on winter wheat in Stanley, Haakon, Jones and Mellette Counties. Damage in most instances was slight. Light infestations of WIREWORMS (Limonius spp.) were found in spring wheat at several localities of the north central and northeast districts. Populations averaged one larva per linear foot of row. Actual damage to the wheat was slight. Populations of ARMY CUTWORM (Chorizagrotis auxiliaris) were much lower than in 1957. Infestations were noted in scattered wheat fields of the west central district where populations averaged one larva per linear foot of row and in alfalfa and small grains in the east central and southeast districts where larvae averaged three per square yard. Little damage occurred in 1958. Scattered infestations of ARMYWORM (Pseudaletia unipuncta) larvae appeared in eastern areas on small grains and alfalfa. The heaviest infestation occurred in Roberts County where approximately 1,000 acres were treated. EUROPEAN CORN BORER (Pyrausta nubilalis) spring surveys indicated a winter survival of approximately 84 percent in the 17 eastern counties. Pupation was underway the third week of May in the southeast district. Moth emergence and egg-laying commenced the second week of June. Egg hatch and accompanying "shot-hole" damage appeared the latter part of June. The first-brood infestation averaged 45 percent with an average of 84 larvae per 100 plants. First-brood pupation with second-brood moth emergence took place the latter part of August. Second brood was light, perhaps because of the very dry weather. The fall survey indicated an average of 51 percent infestation with an average of 91 borers per 100 plants for the 6 districts and 42 counties surveyed. It is estimated that approximately 2,835,000 bushels of corn were lost to the borer, representing a monetary loss of $2,353,000. ALFALFA WEEVIL (Hypera postica) was more troublesome than in 1957. Damage occurred to a number of alfalfa fields that were not treated. Populations in early June reached 40-60 larvae per 10 sweeps in untreated fields of Lawrence County. Larvae were detected for the first time in Ziebach County. Approximately 14,000 acres of alfalfa were treated. SWEETCLOVER WEEVIL (Sitona cylindricollis) adults were active and feeding by the first part of April. Feeding damage ranged up to 50 percent of the plants in older established stands. Larval damage to new seedings of sweetclover was comparatively light.

LYGUS BUGS (Lygus spp.) - Overwintering adults became active the latter part of April. By the middle of May newly-hatched nymphs appeared. Through the months of June and July populations were heavy on alfalfa. Counts averaged 40 per 10 sweeps with counts up to 180 per 10 sweeps noted in some areas. Many alfalfa seed fields had injurious infestations and were treated. ALFALFA PLANT BUG (Adelphocoris lineolatus) began to appear in economic numbers on alfalfa the first part of June, populations averaging 14 per 10 sweeps. Later in the summer populations averaged 36 per 10 sweeps on alfalfa. Injurious infestations were noted on many alfalfa seed crops. POTATO LEAFHOPPER (Empoasca fabae) was first collected in the State May 29th on alfalfa in the southeast district. On June 5 it was collected in the east central district. Populations were light on alfalfa throughout the growing season. Some "hopperburn" damage appeared in potato fields of the northeast. PEA APHID (Macrosiphum pisi) began to appear in alfalfa fields around the latter part of April and the first part of May. The spring season was cool and conducive to reproduction of this species. By the first part of June, hundreds per sweep were encountered.

Many calls were received requesting information on control. In certain areas, alfalfa showed some damage symptoms. The hot, dry weather of mid-summer, coupled with an increase in predators, reduced aphid numbers so that they ceased to be a problem for the rest of the season. ENGLISH GRAIN APHID (Macrosiphum granarium) infested small grain throughout the State during late spring and early summer. The weather was also conducive to rapid buildup of this pest. By early summer it was not unusual to see hundreds of aphids on a single small grain plant. Some damage occurred on small grains that were planted in light and sandy soils. The hot, dry weather of mid-summer reduced the populations to noneconomic levels. ALFALFA CATERPILLAR (Colias philodice eurytheme) larvae first began to appear in alfalfa fields around the middle of May. Populations remained light throughout the season; the larvae never averaged more than one per 10 sweeps. BEAN LEAF BEETLE (Ceratoma trifurcata) infestations were noted on soybeans in Clay and Union Counties. Slight damage occurred to foliage and populations averaged one adult per linear yard of row. Adults of SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) appeared the first part of June in alfalfa, feeding on the blossoms. By August and September, adults of WESTERN CORN ROOTWORM (D. virgifera) and NORTHERN CORN ROOTWORM (D. longicornis) were also appearing in alfalfa fields. Populations averaged 4 per 10 sweeps. Many reports were received of corn rootworm damage to corn fields in the southeast and south central districts. Most of the damage appeared to be confined to nonrotated fields. Approximately 52,490 acres were treated for control this spring. ASH-GRAY BLISTER BEETLE (Epicauta fabricii) appeared in alfalfa fields the latter part of May. During June and July they averaged one per net sweep. BLACK BLISTER BEETLE (Epicauta pennsylvanica) was noted in some localities of the north central district where they averaged one per sweep in alfalfa. A FIELD CRICKET (Acheta sp.) was more abundant than usual during the latter part of the summer. Some alfalfa seed fields were treated as population counts in some areas reached 15 per square yard. SPOTTED ALFALFA APHID (Therioaphis maculata) was not reported in the State during 1958.

Fruit Insects: APPLE MAGGOT (Rhagoletis pomonella) was the most troublesome and damaging insect pest of fruit in 1958. Considerable damage was reported from the east central and southeast districts on apple. PEAR-SLUG (Caliroa cerasi) infestations were reported from cherry trees and a pear tree in the south central district. EUROPEAN RED MITE (Panonychus ulmi) adults were observed by the middle of May feeding in apple trees in the east central district. Some leaf damage was noted by late summer.

Truck Crop Insects: CUCUMBER BEETLES, both Diabrotica unidecimpunctata howardi and Acalymma vittata, were abundant on cucurbits throughout the summer. POTATO LEAFHOPPER (Empoasca fabae) was quite abundant in some localities. "Hopperburn" on garden potatoes was quite evident in some areas. POTATO FLEA BEETLE (Epitrix cucumeris) was abundant in eastern areas on potatoes. Untreated potatoes showed leaf-feeding damage. CABBAGE APHID (Brevicornye brassicae) and MELON APHID (Aphis gossypii) were more abundant than usual in home gardens throughout the State.

Forest, Ornamental and Shade Tree Insects: PINE BARK APHID (Pineus strobi) was numerous and active on white pine in the Sioux Falls vicinity by the first part of June. COTTONWOOD LEAF BEETLE (Chrysomela scripta complex) infestations were reported from cottonwood and poplar in various parts of the State. APHIDS were very numerous on shade trees throughout the State. Many complaints were received on the excessive "honeydew". An infestation of ELM CALLIGRAPHA (Calligrapha scalaris) adults was reported from elm in Hutchinson County. Many FALL WEBWORM (Hyphantria cunea) infestations were noted on cottonwoods and aspen throughout the State. Various reports of OYSTERSHELL SCALE (Lepidosaphes ulmi) infestations on apple and shade trees throughout the State were received. ELM SAWFLY (Cimbex americana) infestations were reported on elm and willow from various localities in the southeast and south central districts. PINE NEEDLE SCALE (Phenacaspis pinifoliae) continues to be a problem throughout the State on ornamental conifers.

Insects Affecting Man and Animals: CATTLE GRUBS (Hypoderma bovis and H. lineatum) - Counts made on 103 untreated calves in Meade County in March showed an average of 13 grubs per head. Heel fly activity was prevalent during early summer. Approximately 9 percent of the cattle in the State received some treatment for grub control. HORN FLY (Siphona irritans) was abundant throughout the State. It is estimated that 50 percent of the cattle in the State received some treatment for horn fly control. CATTLE LICE (Linognathus vituli and Haematopinus eurysternus) were prevalent on cattle throughout the State. Approximately 31 percent of the cattle received some form of treatment. POULTRY LICE and MITES were a problem to chicken flocks. NORTHERN FOWL MITE (Ornithonyssus sylviarum) was especially troublesome. An interesting problem occurred in the municipality of Brookings where a small child was being bitten by CHICKEN MITE (Dermanyssus gallinae). The infestation source was believed to be from pigeons which frequented the roof of the home.

Stored-product Insects: INDIAN-MEAL MOTH (Plodia interpunctella) infestations were reported throughout the State, some of them in homes as well as granaries. Infestations of FLOUR BEETLES (Tribolium spp.) were noted from many localities and many sources, including homes, granaries and cribs. SAW-TOOTHED GRAIN BEETLE (Oryzaephilus surinamensis) infestations were reported from several localities in the State, both from infestations in homes and granaries. Several infestations of CADELLE (Tenebroides mauritanicus) were reported from stored grain in the southern regions.

Miscellaneous Insects: POWDER POST BEETLES (Lyctus spp.) were reported several times in homes. SUBTERRANEAN TERMITES were reported from Pennington and Davison Counties. This was a first record for Davison County. BLACK CARPET BEETLE (Attagenus piceus) infestations were reported from homes in Minnehaha and Lincoln Counties.

SUMMARY OF INSECT CONDITIONS - 1958

NORTH DAKOTA

Compiled by Vance V. Goodfellow

Highlights: During 1958 approximately 778,000 acres were treated to control GRASSHOPPERS. Infestations, in general, were confined to western areas which had scattered, severe infestations. ENGLISH GRAIN APHID and CORN LEAF APHID populations were much above normal during June. Little injury was observed; however, 50,000 acres were sprayed to protect late crops of wheat, oats and barley. BEET WEBWORM moths were extremely abundant in all areas during the week of June 2. Scattered larval infestations attacked sugar beets, wheat, flax and safflower, and control measures were required to protect these crops. Approximately 75,000 acres of cropland were treated to control beet webworm. This year's infestation was the heaviest since 1950.

Cereal and Forage Insects: GRASSHOPPER infestations during 1958 were generally noneconomic over most of the State, although threatening to severe infestations did occur at scattered locations in the western area. In an area comprising Burke, Divide and northern Williams Counties the infestation was severe and widespread. The dominant species was Melanoplus bivittatus (75 percent) followed by M. bilituratus and M. femur-rubrum. Chemical control measures directed at nymphal populations gave excellent crop protection. No serious grasshopper problem developed on rangeland. During 1958 approximately 778,000 acres were sprayed to control grasshoppers. Fall surveys indicate a generally light infestation in 1959 except for a few localized areas. The main area for concern is in northwestern counties where serious drought conditions prevailed in 1958. No serious rangeland infestation is expected. WHEAT STEM SAWFLY (Cephus cinctus) continues to be a major pest of wheat in the northwestern area. The 1958 infestation, however, was the lightest in the last four years. Cool, windy weather during the flight period may have contributed to this lowered infestation. The average infestation showed 20-40 percent of the stems infested. Only a few fields had infestations above 50 percent. An estimated 78 percent of the overwintering EUROPEAN CORN BORER (Pyrausta nubilalis) larvae survived the winter in southeastern counties. Pupation neared completion on June 15. Cool, rainy weather during June and July slowed corn growth, adult moth emergence and egg-laying. The hatch of first-generation borers reached its peak the week of July 28. At the peak period, infestations in general were noneconomic. An average of 45 percent of the plants were infested with approximately 4 borers per infested plant. Egg-laying, however, continued and was spread over a long period. It continued until August 15 resulting in an increased number of infested plants. First-generation borer development was slow; only 13 percent of the borers pupated and emerged as compared with 50 percent in 1957. No second-generation infestation developed. Fall abundance survey in six southeastern counties, Grand Forks, Traill, Cass, Richland, Sargent and Ransom, showed the highest borer population ever recorded. In this area 74 percent of the plants were infested with an average of 179 borers per 100 plants. The estimated corn loss due to corn borer injury in 1958 was 5.3 percent.

ENGLISH GRAIN APHID (Macrosiphum granarium) populations were general and high over most of the eastern area during June. Infestations were confined mostly to wheat and barley. Some control work was done in a few areas; however, no field surveyed showed aphid injury, and populations were mostly below economic levels. PREDATORS increased slowly but were present in numbers high enough to aid control of aphids. In late July, syrphid flies were more numerous in eastern North Dakota than they had been in many years. Scattered infestations of CORN LEAF APHID (Rhopalosiphum maidis) were present in barley and oats. Populations were generally below economic levels. Some control work was done in late planted fields. Light to moderate infestations occurred in corn during late July and August. Approximately 50,000 acres of small grain were sprayed for English grain and corn leaf aphids. Populations of THRIPS in barley were light and only an occasional field had economic numbers. Approximately 25,000 acres of late barley were treated. One of the most widespread infestations of BEET WEBWORM (Loxostege sticticalis) experienced in many years occurred in the State this season. Adults were observed in all areas during the week of June 2. Scattered severe infestations attacked sugar beets, wheat, flax and safflower, and control measures were necessary to protect these crops. A severe infestation in a two-year-old shelterbelt near Bismarck defoliated the trees. Approximately 75,000 acres of cropland were treated. Pupae were collected in several stubble fields during the fall, especially in the western part of the State. Severe infestations of ARMYWORM (Pseudaletia unipuncta) were confined to a few fields of rye in the southeastern area. Larvae in a wide range of development could be found in most grain fields throughout the southern Red River Valley; however, their numbers seldom exceeded one per square foot. No control measures were required except in rye fields where an estimated 9,000 acres were treated. The first collection of SIX-SPOTTED LEAFHOPPER (Macrosteles fascifrons) was made from sweetclover on May 13 at Mapleton; one adult per 100 sweeps. By May 30, adults were easily recovered from legumes and cereals but their numbers were low, six adults per 100 net sweeps. This trend continued throughout the season. Only a trace of the aster yellows was observed in flax during 1958. The first POTATO LEAFHOPPER (Empoasca fabae) specimen of the year was collected on June 6 at Fargo. Populations in legumes remained light all season. Heavy adult populations of SWEETCLOVER WEEVIL (*Sitona cylindricollis*) caused severe defoliation in some mature sweetclover stands during early June. Heavy populations of PEA APHID (*Macrosiphum pisi*) occurred in alfalfa throughout the season in most of the State. TARNISHED PLANT BUG (*Lygus lineolaris*) infestations in alfalfa were generally higher than usual over the State. ALFALFA PLANT BUG (*Adelphocoris lineolatus*) populations were above normal this season. Heavy infestations of a FIELD CRICKET (*Acheta* sp.) occurred in Red River Valley counties and at other scattered locations during August. Larvae of a THISTLE BUTTERFLY were numerous on Canada thistle. Injury to soybeans was reported at three locations. DIAMONDBACK MOTH (*Plutella maculipennis*) larvae were numerous in wild mustard in the eastern part of the State. No crop injury was reported from any area. WIREWORM infestations damaging small grains were reported in a few localities. However, control measures were applied to an estimated 177,800 acres.

Fruit Insects: One of the heaviest and widespread outbreaks of PLUM CURCULIO (*Conotrachelus nenuphar*) in recent years occurred on plum in 1958. Petal-fall sprays gave good control where applied. CYCLAMEN MITE (*Steneotarsonemus pallidus*) is becomming more numerous in everbearing strawberry plantings.

Truck Crop Insects: ONION MAGGOT (*Hylemya antiqua*) was responsible for a 10-15 percent yield reduction in commercial onion fields in the Fargo area. Home garden plantings were destroyed at many other locations. The infestation was the heaviest in several years. COLORADO POTATO BEETLE (*Leptinotarsa decemlineata*) populations were extremely light in potato-growing areas. POTATO FLEA BEETLE (*Epitrix cucumeris*) was fairly abundant the early part of the season. Some damage was observed in unsprayed fields. Despite favorable weather conditions, GREEN PEACH APHID (*Myzus persicae*) and POTATO APHID (*Macrosiphum solanifolii*) did not develop densities of major economic importance. Potatoes in a few fields in southeastern portions of the Red River Valley where aphids were not controlled showed symptoms of Virus Y and leaf roll. SIX-SPOTTED LEAFHOPPER (*Macrosteles fascifrons*) and POTATO LEAFHOPPER (*Empoasca fabae*) were not abundant in potatoes in 1958. Purple top incidence was about normal. POTATO PSYLLID (*Paratrioza cockerelli*) was present but not in economic numbers. SUGAR-BEET ROOT MAGGOT (*Tetanops myopaeformis*) infestations were very low. Adult flies were not abundant and oviposition was hampered by cold weather. Approximately 18,500 acres of sugar beets were treated with a custom-formulated, insecticide-fertilizer mixture to protect the crop. BEET WEBWORM (*Loxostege sticticalis*) infestations were moderate to heavy in sugar beets over a prolonged period. First larvae were observed the week of June 16, about a month earlier than in 1957. Substantial acreages were treated for control. The 1958 outbreak was the heaviest since 1950. Home garden infestations of CUTWORMS were numerous; however, infestations reported in field crops were very low.

Ornamental and Shade Tree Insects: PINE NEEDLE SCALE (*Phenacaspis pinifoliae*) continues to increase its range over the State. Severe infestations exist in several communities. OYSTERSHELL SCALE (*Lepidosaphes ulmi*), COTTONY MAPLE SCALE (*Pulvinaria innumerabilis*), SCURFY SCALE (*Chionaspis furfura*) and a LECANIUM SCALE infestations were numerous during 1958 and a general buildup of all scales throughout the State is indicated. Heavy infestations of SPIDER MITES (*Tetranychus* spp.) were present on spruce and juniper throughout western areas. Elsewhere, infestations were spotty. Infestations of APHIDS, although numerous on shade trees and ornamental shrubs, were not as heavy and widespread as in 1957. SNOWBALL APHID (*Anuraphis viburnicola*) caused severe leaf distortion where not controlled. *Cinara palmerae* and *Cinara* sp. (probably undescribed) collected from Black Hills spruce and Colorado spruce at Bismarck and Casselton, are new records for the State. Determinations by F. C. Hottes. WILLOW SAWFLY (*Nematus ventralis*) larvae were collected from willow in a shelterbelt planting in the eastern part of the State. Defoliation was severe in 50 feet of a one-fourth mile row of trees. FALL WEBWORM (Hyphantria cunea) infestations were the lightest in a number of years. FOREST TENT CATERPILLAR (Malacosoma disstria) caused heavy defoliation in native timber stands at the Fort Totten Indian Reservation and Sullys Hill Federal Wildlife Refuge in the north central area. Surveys conducted by the Forest Service indicated a possible increase in tree defoliation and infested area in 1959.

Household and Stored-product Insects: CARPET BEETLE (Anthrenus scrophulariae) infestations continued numerous in all areas. BROWN-BANDED ROACH (Supella supellectilium) infestations are becoming more numerous and widespread in the State. Calls were numerous regarding CAMEL CRICKETS infesting home basements in the Fargo area. CLOVER MITE (Bryobia praetiosa) infestations in homes were numerous in the spring and fall.

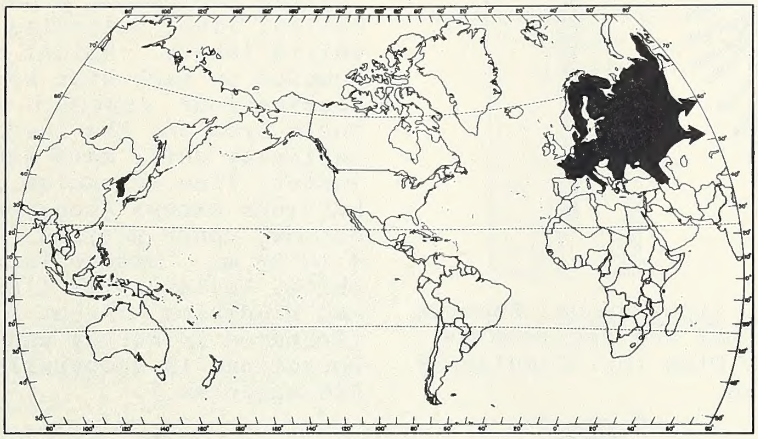
Insects Affecting Man and Animals: The eastern areas of the State suffered the worst MOSQUITO problem ever recorded. Single night light trap counts in rural areas reached 35,000 to 70,000 per trap per might and in one trap exceeded 150,000 adults in a single night. The predominant species in light trap collections was Aedes vexans. Culex tarsalis populations were somewhat higher than normal although they constituted a lower than normal percentage of the total season's collections. C. tarsalis larvae were found in temporary pools during certain periods of the summer and were not uncommonly associated with A. vexans at these times. Other species, notably A. dorsalis, C. p. pipiens and C. restuans, were either of normal or slightly less than normal abundance. The unusually high populations of A. vexans stimulated interest in mosquito abatement in the Red River Valley area.

INSECTS NOT KNOWN TO OCCUR IN THE UNITED STATES

SPRUCE BARK BEETLE (Ips typographus L.)

Economic Importance: This bark beetle is considered to be one of the most destructive pests of spruce on the continent of Europe. Extensive injury to forests, resulting from wars, fires and storms, has at numerous times made possible the buildup of high populations of the pest which caused excessive secondary damage. Observations in Sweden in 1932, following storms, showed a peak abundance of 520,000 beetles per acre in spruce forests. In addition to damaged trees, this species also attacks healthy trees. The capacity for breeding in very fresh bark, coupled with the habit of continuing to feed in the bark on completion of development, makes the insect a serious pest of spruce forests. Ips typographus prefers thick, succulent bark, but will adapt itself readily to bark of different thicknesses and generally prefers parts of the tree more than 3 feet from the ground. A very similar Ips beetle, recorded as I. t. japonicus Niij., is known to occur in Japan, Korea and the Soviet Far East, but is generally regarded as a subspecies of I. typographus.

Distribution: Recorded in most of Continental Europe, USSR and Korea. Ips t. japonicus is recorded in Japan, Korea and the Soviet Far East.



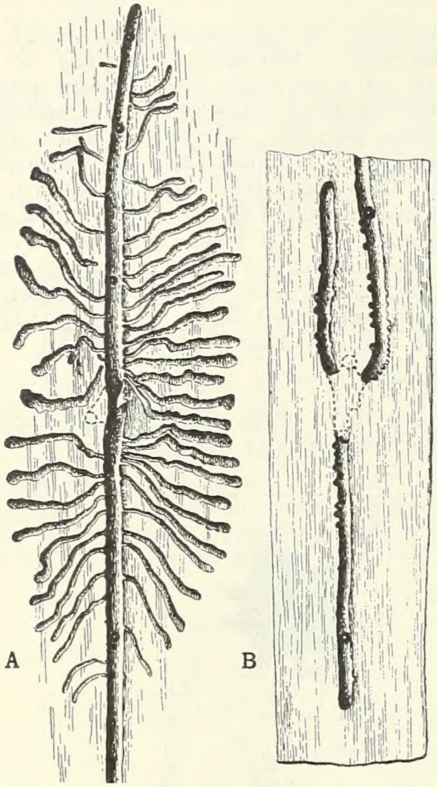
General Distribution of Ips typographus

Hosts: Prefers spruce, but will attack pine and other conifers.

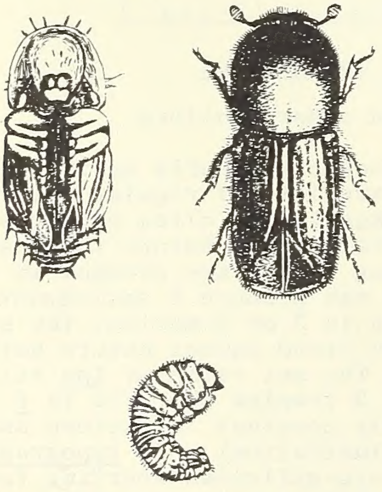
Life History and Habits: In Germany, breeding begins in early spring, the date varying according to weather conditions. Eggs are laid at regular intervals in egg-pockets along the sides of egg-galleries. Egg-laying often requires 3 weeks or more, larvae from the first-laid eggs being half grown before the last eggs are laid. Frequently the larvae, pupae and young adults are present in the same brood system. Under normal conditions, parents may produce 2 successive broods during the same year, the first brood developing in 2 or 3 months, the second maturing before winter. If, however, the second brood cannot mature before winter, development is completed the next spring. The sex ratio of Ips will vary according to the species, the normal being 2 or 3 females per male in I. typographus. The egg-galleries of Ips are fairly constant in pattern and to some degree may indicate the species present (see illustration). I. typographus normally constructs a 3-armed gallery system with egg-galleries starting from a central pairing chamber. The galleries extend about 5 inches, invariably directed to the long axis of the trunk. Larval tunnels seldom exceed 1¼ inches in length. Egg-galleries may vary from the general pattern, however, depending on population, and on whether attack is on felled or standing trees.

(Scolytidae, Coleoptera)

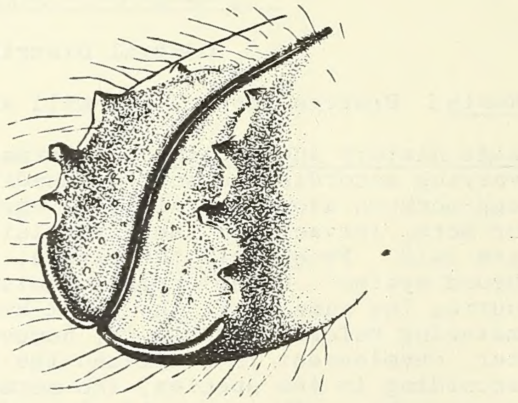
Description: Adults are dark brown, almost black. The front of head covered with long yellowish hairs and small granular tubercles; club of antenna flattened and almost circular, slightly narrower near tip. Sutures of club strongly arched or curved. The prothorax longer than broad, very rough and wrinkled in front and sides; finely punctured behind on each side of a smooth impunctate central line. Front and sides of prothorax thickly clothed with long yellow hairs; central rear portion without hairs. Elytra about one and one-half times as long as combined width. Striae on each side of elytra on upper portion deep and strongly punctured, becoming wider towards the apical declivity; elsewhere striae very shallow and regular. Front edge and sides of elytra with hairs, becoming dense along sides. Apical declivity strongly excavated; extending to about one-third of each elytron; a central depression along suture or central line, extending halfway along entire length. Apical declivity bounded on each side by raised margin bearing four distinct teeth, third tooth from top the largest. Characteristically dull, matt surface of silky luster, fine irregular punctures and hairless except along margins and narrow, upper portion. Total length 4 to 5½ mm. Mature larvae thickset, white, legless with light brown head and mandibles. About 5 mm. in length. (Prepared in Survey and Detection Operations in cooperation with other ARS agencies.).



Galleries of I. typographus, Showing Larval Tunnels (A) and Egg-pockets as Indicated by Pips (B). Copulatory Chamber Outlined.



Stages of Ips typographus



Apical Declivity of Ips typographus

Figures (except map): Larva, pupa and adult from Tashenberg, E. P. 1884. Die insecten, tausendfussler und spinnen. Brehms Thierleben Allgemeine Kunde des Thierreichs. 2nd. Ed. Vol. 1 (Leipzig) 711 pp. Apical declivity from Balachowsky, A. 1949. Faune de France, Coleopteres, Scolytides. 320 pp., Paris. Galleries from Boas, J. E. V. 1923. Dansk Forstzoologi. 763 pp., Copenhagen.

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